

# FLIGHT

The  
AIRCRAFT  
ENGINEER  
&  
AIRSHIPS

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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## Flight

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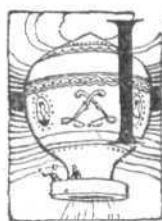
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### DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

Nov. 15 ....	"The Thermodynamics of Aircraft Engines," by Mr. H. R. Ricardo, before R.Ae.S.
Nov. 29 ....	"The Development of High-Speed Aircraft," by Major R. H. Mayo, O.B.E., F.R.Ae.S., at the Royal Society of Arts.
Nov. 30 ....	"The Result of Twelve Years' Welded Tube Construction and the Development of Cantilever Wings," by A. H. G. Fokker, before I.Ae.E.
Dec. 1 ....	Entries close for French Aero Engine Competition
Dec. 5 ....	R.A.F. Wireless Re-union.
Dec. 7 ....	"Water-Cooled Aero Engines," by A. J. Rowledge, before I.Ae.E.
Dec. 13 ....	"Air Strategy," by Wing Cmdr. Edmonds
Dec. 14 ....	"Leader Cable Systems for Electrical Steering of Aeroplanes," by J. Gray, before I.Ae.E.
1924	
Jan. 10 ....	"Materials from the Aeronautical Point of View," by Dr. Aitchison and Mr. North
Jan. 24 ....	"Fabric and Dopes," by Dr. Ramsbottom
Feb. 7 ....	"Airmanship at Sea," by Sqd.-Ldr. Maycock, O.B.E., R.A.F., before R.Ae.S.
Feb. 21 ....	"Aerial Photography and Survey," by Mr. H. Hamshaw Thomas
Mar. 1 ....	French Aero Engine Competition
Mar. 6 ....	"Sound Detection," by Major Tucker

## EDITORIAL COMMENT.



It was very appropriate, and in some ways may be regarded as prophetic, that the conclusion of this year's Imperial Conference should take the form of a visit to Croydon to witness a demonstration of some of the later type of British service and commercial aircraft. Air power—and by that we mean civilian no less than Service air strength—will play an increasingly important rôle in the future of the British Empire, and it is permissible to hope, and indeed to believe, that the Dominion Premiers and other representatives who visited Croydon aerodrome on Saturday last will have brought away with them not only a very vivid impression of the general excellence of British aircraft, but also a strong realisation of the vital necessity of developing, by every means in our power, the air strength of the Empire. The very evident interest which, without exception, the Dominion representatives showed in all the different types of machines augurs well for the future, and the visit to Croydon should do much to prepare the way at an early date for closer co-operation between the Mother Country and the "Sister nations," as they are termed in the message to the Throne.

If we turn to the Report on the deliberations of the Imperial Conference, which has been very promptly issued, thus departing from the secrecy maintained regarding Conferences of previous years, it is to be feared that on the all-important question of defence from the Imperial standpoint no definite results have been achieved. It appears that the Imperial Conference has gone little farther than to reaffirm the fairly obvious fact that "it is necessary to provide for the adequate defence of the territories and trade of the several countries comprising the British Empire." As to how such adequate defence is to be attained, and how the burden is to be distributed, there seems to be little in the way of constructive suggestion offered. At best we can hope that something more concrete is in existence in the background.

Under paragraph 3 (e) of the Defence Resolutions is suggested as a guiding principle "The desirability of the development of the Air Forces in the several

countries of the Empire upon such lines as will make it possible, by means of the adoption, as far as practicable, of a common system of organisation and training and the use of uniform manuals, patterns of arms, equipment, and stores (with the exception of the type of aircraft), for each part of the Empire as it may determine to co-operate with other parts with the least possible delay and the greatest efficiency."

With every respect for the Imperial Conference, to the lay mind it would appear that this decision and "guiding principle" could very well have been arrived at without going to the trouble of lengthy conferences, and the Empire units have, it seems to us, a right to expect something rather more defined than this. We fully realise that the ultimate details are matters for the respective Parliaments to work out and settle as seems best to them, but while gathered in the Capital of the Empire the Premiers might have provisionally agreed on certain broad definite lines, subject to confirmation and a certain amount of revision by their respective Parliaments.

Paragraph 4 (c) of the Defence Resolutions states that the Conference takes note of "the necessity for the maintenance by Great Britain of a Home Defence Air Force of sufficient strength to give adequate protection against air attack by the strongest air force within striking distance of her shores." This principle was laid down some time ago—before the opening of the Imperial Conference, in fact—and is being acted upon by the proposed increase in the strength of the active squadrons of the R.A.F. In any case, the defence of London and of Great Britain is, after all, mainly a "domestic" matter for the

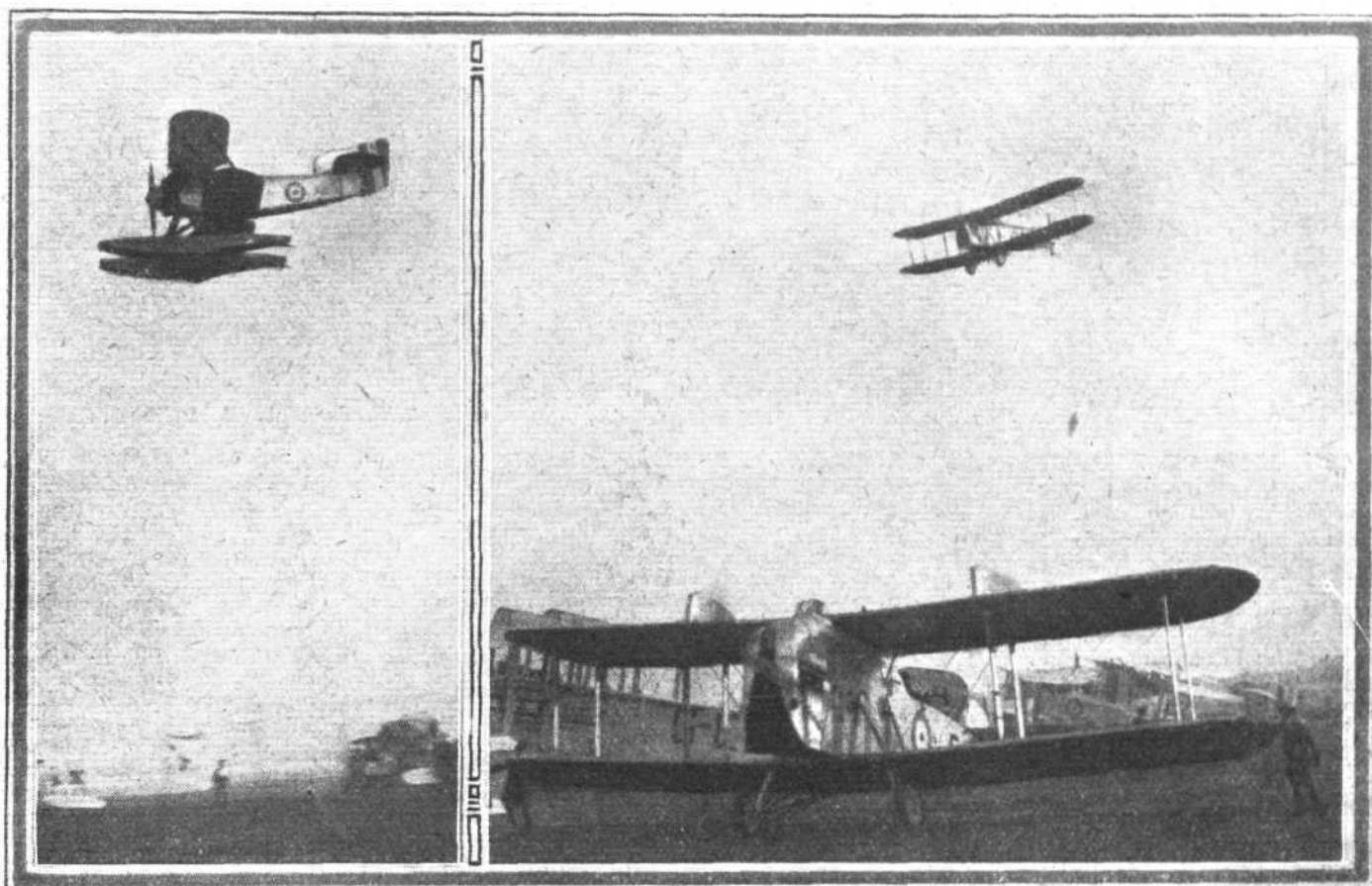
Home Government to decide, and one in which the Dominions have but little direct concern. So far as the official Summary is concerned, the two paragraphs with which we have dealt are the only references to air matters.

From the foregoing it might be thought that we are not very optimistic as regards Imperial air matters. As a matter of fact we are, but we are a little disappointed that apparently so little was actually done, although the opportunity would seem to have been very opportune for accomplishing much. Our main hope of initial progress must, we think, lie in the development of civil air transport within the Empire. The importance of rapid and frequent communications between the far-flung sections of the Empire cannot be exaggerated, and if the air, as seems highly probable, should prove the means of ensuring more frequent visits by leading representatives of the Dominions and India to the Mother Country, that fact alone, apart altogether from the obvious advantages to Imperial commerce of rapid air communication, will do a very great deal towards a better understanding of our various common problems, and will strengthen immensely the bonds that bind us together. It is therefore with considerable satisfaction that we are assured by the Secretary of State for Air that he intends to press on steadily with the development of civil air transport within the Empire. So long as that determination remains unshaken and is acted upon to the best of our ability, even if it should fall somewhat short of what could be desired, we feel sure the Empire is on the right road, and may look forward to the future with considerable confidence.

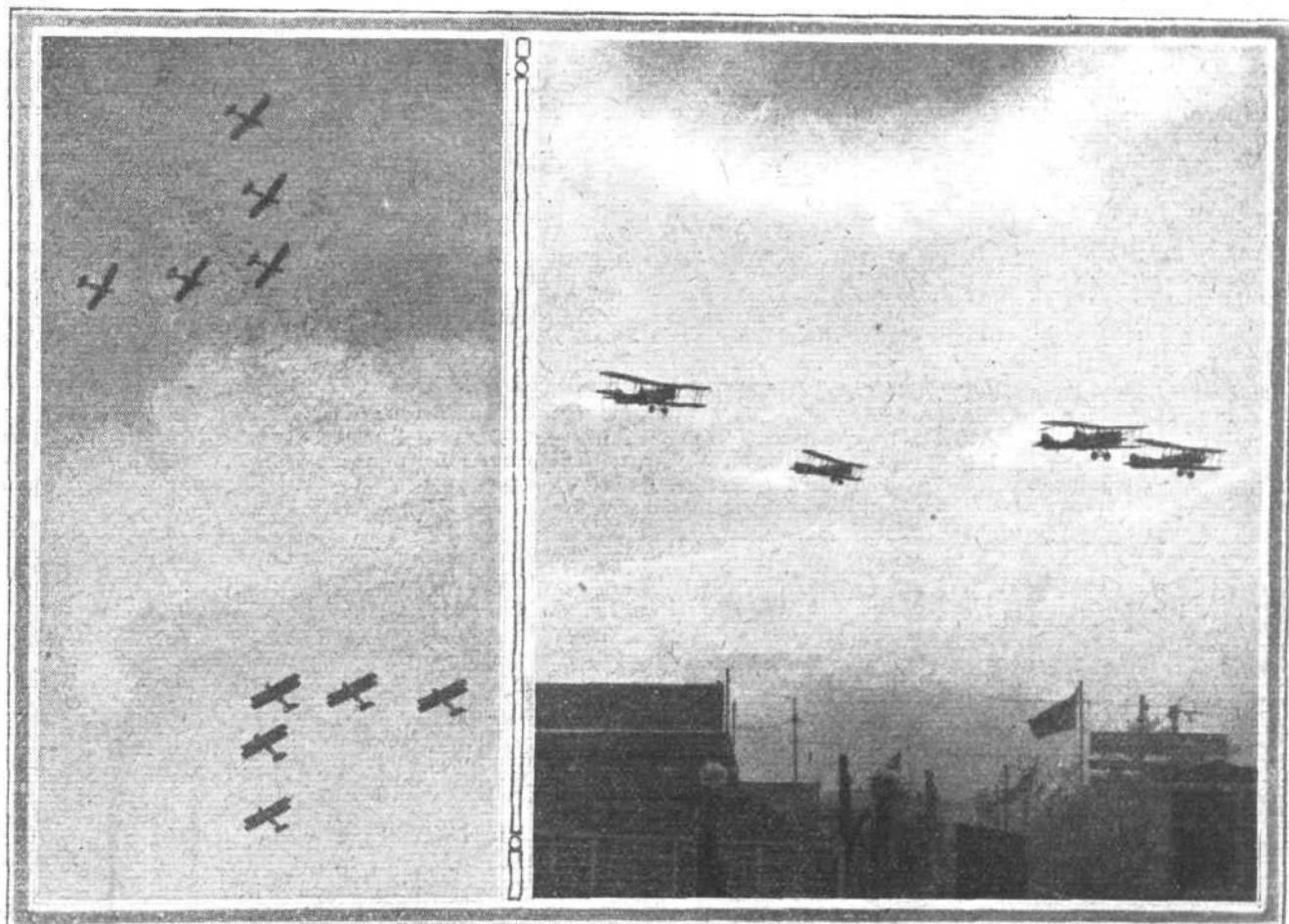


**PREMIERS AT CROYDON :** An interesting group of personalities photographed on the occasion of the visit of Premiers and representatives of the Dominions and India to the London Terminal Aerodrome on Saturday November 10. Left to right : The Rt. Hon. Viscount Peel, C.B.E., the Rt. Hon. Peter C. Larkin, the Rt. Hon. W. L. Mackenzie King, C.M.G., M.A., LL.D., Lieut.-Col. the Rt. Hon. Sir Samuel Hoare, Bart., C.M.G., M.P., General the Right Hon. J. C. Smuts, P.C., Mrs. Bruce, the Rt. Hon. S. M. Bruce, M.C., Air Vice-Marshal Sir W. G. H. Salmond, K.C.M.G., C.B., D.S.O., and the Duchess of Sutherland.

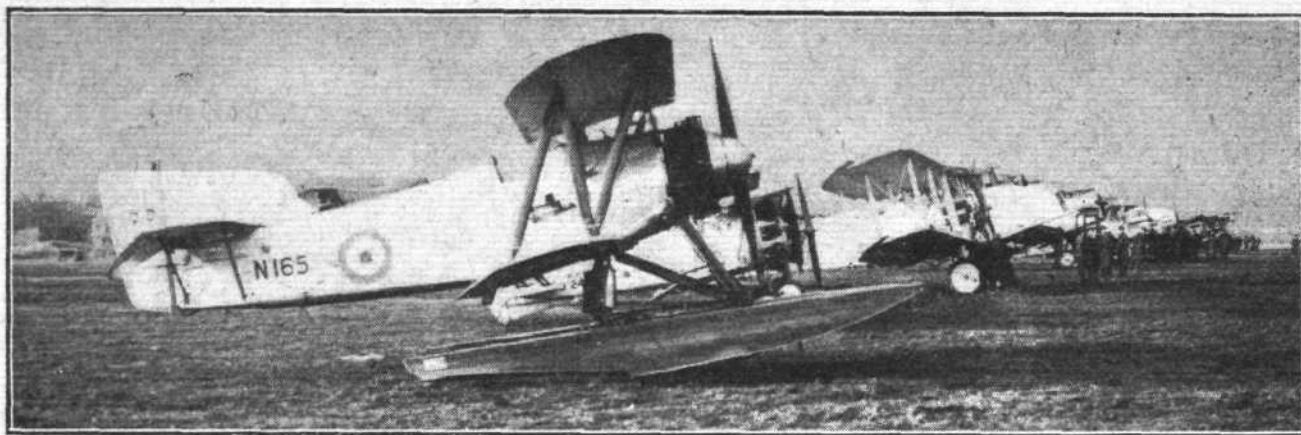




**SALUTING THE DOMINION PREMIERS AT CROYDON :** On the left, the Fairey "Flycatcher" amphibian, and, on the right, the Blackburn "Dart" flying above the Blackburn "Blackburn" fleet spotter. Both are fitted with Napier "Lion" engines, while the Fairey machine has a Siddeley "Jaguar" of 360 h.p.



**FORMATION FLYING AT CROYDON :** On the left, two sections of No. 39 Squadron on D.H.9A's meet in formation flying, while, on the right, some of the same machines are seen coming in after their demonstration.



ONE LINE OF MACHINES AT CROYDON "REVIEW": In the foreground the Fairey "Flycatcher."

BETWEEN 50 and 60 aeroplanes of different types were "paraded" before the Prime Ministers and other representatives of the Dominions and India at the Demonstration held at Croydon aerodrome on Saturday, November 10. Over 200 invitations had been sent out, most of which were accepted, and among the distinguished visitors were, in addition to the Dominion representatives, members of the British Government, chiefs of the R.A.F., representatives of the Army and Navy, and the leading personalities in the aviation world. It had been announced before the demonstration that the public would not be admitted on this occasion, but apparently this decision was changed at the last moment, as the public enclosure was as a matter of fact thrown open, and a fair number of visitors took the opportunity of watching an exceptionally fine display of flying. Nor could any harm possibly result, as the public enclosure was so far removed from the place on the aerodrome where the machines were drawn up that nobody not in possession of a card of admission could get sufficiently close to discover anything which should not be disclosed at present.

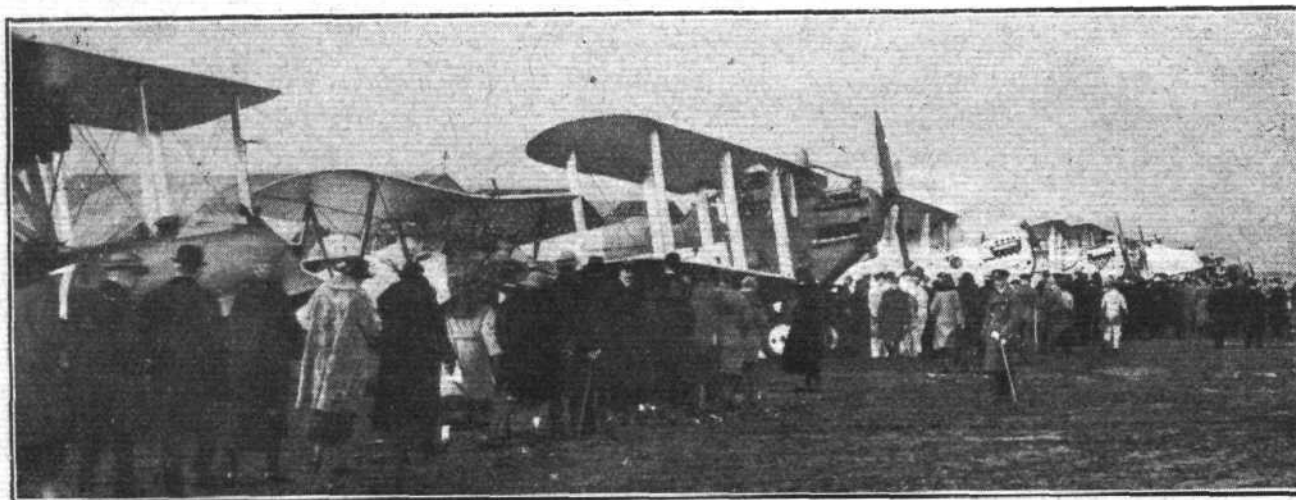
The demonstration was



AT THE CROYDON DEMONSTRATION: Air Chief-Marshal Sir Hugh M. Trenchard, Bart., K.C.B., D.S.O., A.F.C., in conversation with Air Vice-Marshal J. F. A. Higgins, C.B., D.S.O., A.F.C., Air Officer Commanding Inland Area.

organised mainly by the R.A.F., and the visitors were the guests of His Majesty's Government. A very interesting programme had been arranged, and every thing went off with that clockwork regularity that characterises the Aerial Pageant, with the additional advantage that the programme was not confined entirely to service machines but included a fairly representative selection of commercial and light aeroplanes.

The first item on the programme was an inspection of the machines taking part in the demonstrations, which had been drawn up in three lines abreast, and the Dominion representative and other visitors were conducted round in groups by heads of departments of the Air Ministry, who explained the functions and special points of the various type of machines. The interest evinced by the Dominion representatives promised well for the future co-operation of the Dominions with the Mother Country in air matters, and in this connection it is significant that the light aeroplanes, with their diminutive engines, were examined as carefully and thoroughly as were their more powerful brothers of the service and the airways. More than one of the Dominion



VISITORS INSPECTING THE MACHINES AT CROYDON ON SATURDAY: The machines in the foreground are a Supermarine "Seagull," a Parnall "Plover," and an Avro "Aldershot," with 1,000 h.p. Napier "Cub."

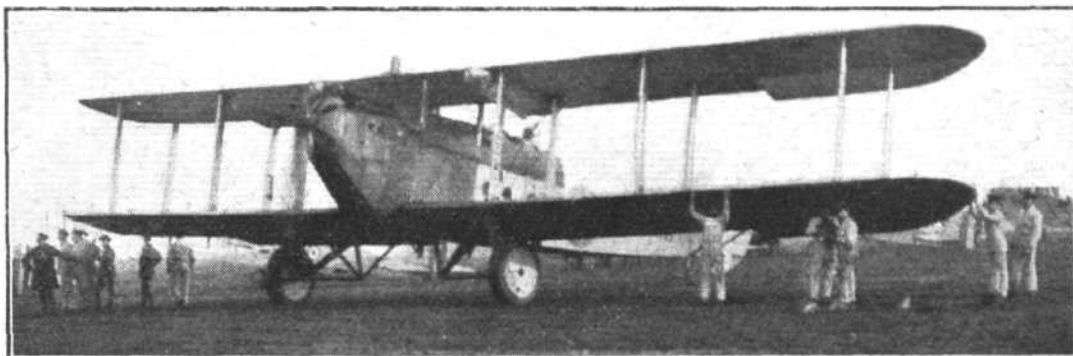


visitors expressed the opinion that in the Colonies there would be a very great future for the light 'plane.

The "ground inspection" finished, the first item on the flying programme was a "fly-past" of machines. First to get away were the light 'planes, of which six different types were present. These were the Avro light monoplane (700 c.c.

be running on one cylinder only as soon as he got well into the air. Macmillan therefore had to make his turn at a very low height, and for a few moments it looked somewhat alarming as he disappeared behind the sheds west of Plough Lane. However, he hove in sight again, coming in very low over the "Level Crossing" and making a perfect landing. It was

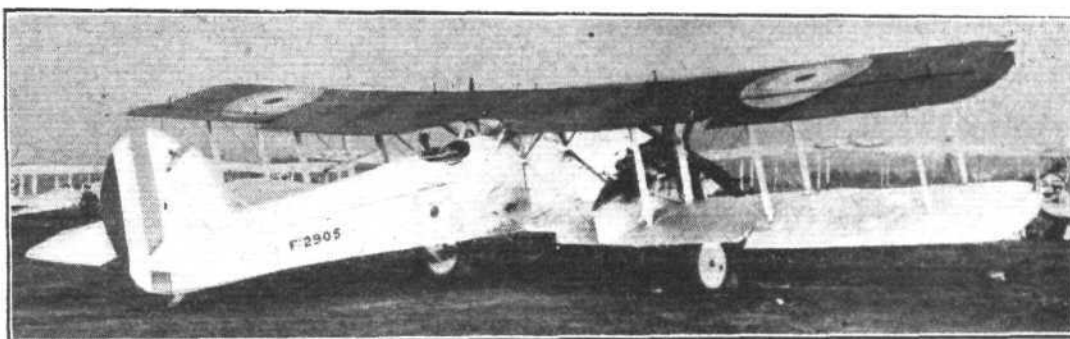
The Avro "Alder-shot" is a long-distance night bomber, with 700 h.p. Rolls-Royce "Condor" engine.



Blackburne engine), piloted by Bert Hinkler; the A.N.E.C. monoplane (700 c.c. Blackburne), piloted by "Jimmy" James; the D.H.53 monoplane "Sylvia II" (700 c.c. Blackburne), piloted by Capt. Broad; the Parnall "Pixie" monoplane (750 c.c. Douglas engine), piloted by Capt. Macmillan; the Vickers "Viget" biplane (750 c.c. Douglas), piloted by Capt. Cockerell; and the "Wren" (400 c.c. A.B.C. engine), piloted by Flight-Lieut. Longton. In spite of a strong and very gusty north-easterly wind the light 'planes got

greatly to be regretted that the "Pixie" should suffer from engine trouble on this occasion, as the machine is very fast indeed when the engine is pulling properly.

The other light 'planes circled around for a few minutes and then, as the larger machines were due to start, they had to come in in spite of any inclinations the pilots might have had to show what these little machines can really do. Hinkler and Cockerell both made very pretty "S" turns as they were nearing the ground, showing the remarkable controllability



The Boulton and Paul "Bourges," with Napier "Lion" engines, is remarkable for its extreme manoeuvrability, and on Saturday, in a sham fight with two Nieuport "Nighthawks," with Bristol "Jupiter" engines, it was repeatedly looped, rolled and spun, manoeuvres not usually possible with large twin-engined machines.

away very well, the first to go being Longton on the "Wren," who was in the air after a surprisingly short run, but who was buffeted about a good deal in the air eddies set up behind the buildings of the Aircraft Disposal Company at the far side of the aerodrome. The other light 'planes followed in quick succession, making a right-hand turn over the aerodrome as they got clear. All flew very strongly, with the exception of the Parnall "Pixie," whose engine was obviously running none too well when Macmillan took off, and which seemed to

of these machines. Broad and James had also been handling their machines with all the skill one expects from these two pilots. Longton, on the "Wren," took the opportunity to show some "slow-flying." Against the wind and with the engine throttle down he hardly made any headway. Just before landing he succumbed to the temptation, and gave a display of "crazy flying." It is to be feared, however, that many of the visitors failed to recognise it as such, and that therefore they may have received a quite erroneous impression



The D.H. 50 is a commercial aeroplane carrying four passengers, although the engine is a Siddeley "Puma" of 230 h.p. only. The cruising speed is about 100 m.p.h.

of the excellent little "Wren," thinking that she was being blown about in that unseemly manner by the strong wind. As a matter of fact, the "Wren," in spite of being so light, is exceptionally stable, and is very steady in a wind.

The light 'planes having "vacated" the air, the fly-past of the larger machines commenced. Among R.A.F. machines

that she had to abandon her flight so as not to interfere with the rest of the programme. Without exception these service machines were remarkable for their extraordinary performance, the single-seaters particularly climbing like rockets. The demonstration cannot have failed to impress the visitors with the excellence of British aircraft and engine design and



At Croydon "review": The Fairey "Fawn," with Napier "Lion" engine, is a two-seater day-bomber. The petrol tanks are mounted above the top plane.

taking part in this, mention may be made of the following: Single-seater fighters: Gloucestershire "Grebe," Siddeley "Siskin," and Fairey "Flycatcher" amphibian seaplane; two-seater reconnaissance machines: Short "Springbok," Vickers "Vixen," and Fairey "Fawn"; single-engined long-distance bombers: Avro "Aldershot" ("Condor" and

construction, and must have shown very clearly that whenever the country decides to spend sufficient money on air defence our constructors are capable of producing machines of the very highest order of excellence.

Several commercial aeroplanes, representative of the machines in regular use on our airways, were also flown past,

The Fairey "Flycatcher" at Croydon "review": This machine is a single-seater fighter for co-operation with the Navy. It is an amphibian twin-float seaplane and is fitted with a Siddeley "Jaguar" radial air-cooled engine.



"Cub"); night-bombers: Vickers "Virginia." The Blackburn "Dart" torpedo-carrier and the Blackburn "Blackburn" fleet-spotter also took part, while the flying-boat type of amphibian was represented by the Supermarine "Seagull." The Boulton and Paul "Bugle" was also to have been flown, but difficulty in starting the engines caused so much delay

of which we mention the Handley Page W.8 twin-engined machine, the de Havilland D.H.34 single-engined type, and the latest de Havilland civilian machine, the D.H.50, winner of the recent competitions at Gothenburg, and the Vickers "Vulcan" single-engined passenger-carrier. The Supermarine "Sea Eagle" was, unfortunately, unable to be present



The Gloucestershire "Grebe" is a single-seater fighter with Armstrong-Siddeley "Jaguar" engine.



owing to adverse weather conditions. On the Friday this machine left Southampton for Croydon, but the weather was so thick that, although the pilot knew that he was somewhere in the vicinity of the aeodrome, he could not see any trace of it, and after circling around for some time decided to return to Southampton. On his way back he ran out of the fog at Guildford, and decided to land in a small field, intending to fly up to Croydon on the Saturday morning. During the night, however, the wind that cleared the fog away had changed, the new direction being such that it was impossible

a single wire. The alighting after the demonstration was also carried out in formation, and the whole demonstration reflects the greatest credit on those responsible for our flying drill.

Perhaps the most spectacular item on the programme was the mock fight between a twin-engined Boulton and Paul "Bourges" and two Nieuport "Nighthawks." Climbing like rockets the two "Nighthawks," fitted with Bristol "Jupiter" engines, reached a height of about 2,000 ft., and there awaited the arrival of the "Bourges." Then com-



At Croydon "review": The Vickers "Vixen" day bomber. This machine is fitted with a Napier "Lion" engine. Note the gravity petrol tanks in the top plane.

to get out of the small field. The result was that the Supermarine "Sea Eagle" commercial flying boat was not able to be demonstrated at Croydon, a fact greatly to be regretted, as this machine is the only commercial type of amphibian flying boat at present in use in this country, and is, moreover, a type that should have the very greatest future in the Dominions.

After the fly-past of the various types of service, civilian, and light aeroplanes, a display was given of squadron flying drill by No. 39 Squadron, mounted on D.H.9A's with Liberty engines. In this connection it is of interest to note that No. 39 was the first squadron to be formed during the War, 1914-18, specially for the purpose of home defence. It was employed from April, 1916, to shortly before the Armistice, in the defence of London, and during that time pilots of No. 39 shot down five Zeppelins and one Gotha. The squadron is now a day-bombing squadron, and during the past summer

menaced a series of evolutions designed to get the machines into positions favourable for machine gun attack. The single-seaters looped, spun, and rolled in an endeavour to "get on the tail" of the large machine, but the latter proved very nearly as manœuvrable, although, naturally, her evolutions occupied a longer period. In the loops, for instance, it was noticed that the "Bourges" seemed to sail along serenely as if there was no special hurry, and it did not appear to matter much whether or not she kept up any air-speed, there was never any tendency to fall out of the loop. Spinning and rolling were also manœuvres well within the capacity of this machine, in spite of the fact that she is a large twin-engined biplane of great span. The rear gunner must often have had opportunities of getting in good bursts on the two single-seaters, and the popping of machine guns was frequently heard, adding realism to the proceedings.

The visitors were then conducted over the air port at



**TWO "REVIEW" VICKERS MACHINES:** On the left, the "Virginia" long-distance bomber, with two Napier "Lion" engines of 450 h.p. each. The car gives a good idea of the span of this machine. On the right, the Vickers "Vulcan" commercial aeroplane, with one Napier "Lion" engine.

has been carrying out bombing trials against H.M.S. *Agamemnon*, with successful results.

At Saturday's demonstration No. 39 Squadron gave a very fine display of formation flying, taking off in two flights in V-formation and carrying out various evolutions, still in close formation. Changing from V-formation to line-ahead, back to V again, and then to column, the machines never lost their position in the formation, and when they crossed the aerodrome in column they were seen to be dead in line as if suspended on

Croydon, and had the various arrangements of the traffic organisation, night lighting system, and wireless and meteorological services explained and demonstrated to them. An aeroplane fitted with wireless, belonging to the Marconi Company, was used for demonstrating the wireless service, two Marconiphone loud speakers mounted near the control tower on the aerodrome enabling the visitors to hear the directions being sent to the pilot from the tower, and the replies of the pilot to the control tower.

At the end of this demonstration the visitors retired to the aerodrome hotel extension, where tea was served. Just after tea, and before the final item of the programme was carried out, Flight-Lieut. Longton again brought out the amazing "Wren" light plane, and gave some demonstrations of slow-flying and stalling, the machine coming out of the dive following the stalls after a surprisingly small vertical drop.

The final item was trick flying in the gathering dusk by an illuminated Sopwith "Snipe," flown by a pilot of No. 32 Squadron. The distinguished visitors then left for London, after having witnessed a particularly interesting demonstration of the present stage of British aircraft development. The proceedings went off without a hitch, the machines shown were, to a considerable extent, new types, and there was never a dull moment during the whole afternoon. The Dominion Premiers were greatly interested, and altogether it may be assumed that the demonstration will have done a great deal of good in bringing before the Dominion representatives the

struts to the body. The D.H.53 is a low-wing monoplane (*i.e.*, the wing is placed at the lower edge of the body), the wing being braced by struts above, to the top of the fuselage. The engine is a Blackburne. The Parnall "Pixie" is also a low-wing monoplane, but has much smaller wings than the de Havilland. The engine is a 750 c.c. Douglas. The Vickers "Viget" is a biplane of standard design, with folding wings. The engine is a 750 c.c. Douglas. The English Electric Company's "Wren" is a high-wing monoplane, and is remarkable for the fact that, although fitted with an A.B.C. engine of 400 c.c. only, it flies as strongly as the old Maurice Farman, which had a 70 h.p. engine.

#### Commercial Aeroplanes

Most of the commercial aeroplanes that took part in the demonstrations were of well-known type, and a brief reference will therefore suffice. The D.H.34, with 450 h.p. Napier "Lion" engine, has been in constant use on the various air



**EVENING AT CROYDON DEMONSTRATION :** On the left, in the air, is seen the Vickers "Viget" light aeroplane and on the right the Avro light monoplane.

possibilities and importance of Imperial aviation, not only for defence purposes but also from the point of view of civil and commercial communication.

#### THE MACHINES

SPACE does not allow of a detailed reference to all the machines taking part in Saturday's demonstrations, nor is it permissible to refer to several of the later types in anything but the most general terms. The best that can be done under the circumstances is, therefore, a very brief indication of the character of the more interesting specimens.

##### The Light 'Planes

Of the six light aeroplanes demonstrated one was a biplane, the other five monoplanes. The Avro monoplane (700 c.c. Blackburne engine) is a cantilever machine (*i.e.*, without external wing bracing) and characterised by tapering wings. The A.N.E.C. monoplane, which also has a Blackburne engine, is a high-wing monoplane (the wing placed on top of the fuselage) and has a rectangular plan form wing, braced by

lines, and is one of the most successful British commercial aeroplanes. It has seating accommodation for eight passengers. The D.H.50 is the latest de Havilland commercial aeroplane, and is the machine that won the recent Gothenburg competitions. Although fitted with a Siddeley "Puma" engine of but 230 h.p., it carries four passengers at a cruising speed of over 100 m.p.h. The Handley Page W.8 is a large twin-engined biplane with two Rolls-Royce "Eagle" engines of 360 h.p. each. It has been in use for a long period on the London-Paris route, and has seating accommodation for 14 passengers. The Vickers "Vulcan" is a single-engined biplane with 450 h.p. Napier "Lion" engine. It is characterised by a very deep, elliptical-section, fuselage extending right up to the top plane, and carries eight passengers. The Supermarine "Sea Eagle," which was prevented from being present, is an amphibian flying boat, with 360 h.p. Rolls-Royce "Eagle" engine. It carries six passengers, and is used on the air service between Southampton and the Channel Islands.



### The Service Machines

Service restrictions prevent a full description of the machines belonging to the Royal Air Force. In the following list we therefore only give the name of the makers, the type of the machine and purpose for which used, and the type and horse-power of the engine: Gloucestershire "Grebe," single-seater fighter, Bristol 400 h.p. "Jupiter" or Siddeley 360 h.p. "Jaguar." Siddeley "Siskin," single-seater fighter, 360 h.p. Siddeley "Jaguar." Fairey "Flycatcher," single-seater fighter for Navy co-operation, Bristol "Jupiter" or Siddeley "Jaguar." Short "Springbok," two-seater for Army co-operation, 400 h.p. Bristol "Jupiter." Avro "Aldershot,"

long-distance bomber, 700 h.p. Rolls-Royce "Condor" or 1,000 h.p. Napier "Cub." Boulton and Paul "Bugle," long-distance day-bomber, two Bristol 400 h.p. "Jupiters." Blackburn "Blackburn," fleet-spotter, 450 h.p. Napier "Lion." Blackburn "Dart," torpedo-plane, 450 h.p. Napier "Lion." Supermarine "Seagull," amphibian fleet-spotter flying boat, Napier "Lion" engine. Fairey "Fawn," day-bomber, Napier "Lion." Vickers "Virginia," night-bomber, two Napier "Lion" engines. Vickers "Vixen," day-bomber, Napier "Lion." Parnall "Plover," single-seater fighter for Navy co-operation, Bristol "Jupiter." Handley Page "Hanley," torpedo-plane, 450 h.p. Napier "Lion."

## THE GUILDHALL BANQUET AND AVIATION

SIR SAMUEL HOARE, Secretary of State for Air, in responding to the toast to the Air Force at the Guildhall Banquet on November 9, said: "A year ago, when I had been Secretary of State for Air for a week, I promised that I would do my utmost to promote British aviation, whether it were military or civil. In the first place I was then and I am now faced with the great and insistent problem of making our air defences secure against air attack, though that attack may be in the highest degree improbable. Our Home Defence Force is already considerably stronger than it was twelve months ago, and month by month it will increase in strength until eventually, as the first necessary stage in our expansion, we shall have a Home Defence Force of 52 squadrons, comprising about 600 first line machines. In this expansion I look to London, and I look to London with some confidence in view of the martial traditions of the capital of the Empire, to play a prominent part. As you may have remarked, I am making an attempt to include amongst these squadrons certain auxiliary formations somewhat on the lines of the Territorials. If my present programme proves to be practicable, I hope in due course to ask the City of London to take the lead in the formation of these auxiliary squadrons and to form a City of London Squadron. Side by side with this squadron I hope to see another auxiliary squadron formed by the County of London, and a third special reserve squadron formed somewhere in the London area. These arrangements must take time to develop, and, whilst I am glad to have this opportunity of announcing my general plan so far as it affects the City and County of London, I say quite frankly that I do not wish to ask for the men and the organisation until the details are fully worked out and the means for training and equipment perfected."

Referring to the appeal, previously made by the Chief of the Imperial Staff (Lord Cavan), for recruits for the anti-aircraft units, Sir Samuel said: "As Secretary of State for Air I am grateful for the help that the Army is giving in this difficult question of air defence, and I am glad to think that the two staffs, the General Staff and the Air Staff, are co-operating with each other wholeheartedly upon this urgent problem."

"I hope that I have said enough upon this military side of my duties to make it plain that the Air Staff and I are engaged to the full extent of our powers in strengthening our air defences. As to the other side of my duties, the civil side, we have had a no less equally busy year. I have had two main problems to solve. In the first place, I have had to try to put our civil air transport upon a sound basis from which it is possible for it to expand and to become in the future a great national asset. I am glad to say that, thanks to the assistance of several men whose names are known and honoured in the City, I have every reason to hope that I shall succeed in this

task. Civil air transport will, I am certain, become in the future one of the recognised means of communication. Even as things are I have during the last six months travelled 2,000 miles in civil machines with safety, comfort, and punctuality."

"In the second place, I have been doing everything that I could to revive the use of airships, both on the ground that they are of strategic value to our fighting forces, and also on the ground that, if they prove successful, they will expedite in a marvellous degree the communications between Great Britain and the distant parts of the Empire. I see no reason why the negotiations, upon which we have been engaged for so many months should not be brought to a successful conclusion, and why the first steps should not be taken for starting a great Imperial air route between Great Britain and the Far East."

I would ask you to continue to give your close interest and support to the development of British aviation, military and civil, and to the attempt that I am making to enable Great Britain to take the lead, to which it is entitled, in the air no less than on the sea and on the land."

Earl Beatty, responding for the Navy, also referred to aircraft. He stated that the improvement in armour protection against the gun is effective against the bomb, and the under-water protection against the torpedo is equally effective against aircraft bombs bursting close alongside a ship. "Nowhere," he said, "is the importance of this arm (Air) more fully recognised than in the Navy. It is not too much to say that in the future no fleet, no ship, will be fully equipped without aircraft. They are becoming an additional indispensable weapon of the fleet, as indispensable as guns or torpedoes, and as much a part of a ship's equipment. To command a fleet in the future, an officer's knowledge of the value and use of aircraft must be as intimate as his knowledge of the value and use of gun, torpedo, and submarine. The aeroplane has definite functions in the gunnery organisation of each ship. It may well be that the Commander-in-Chief and his staff will be quartered on board an aircraft carrier. During operations staff officers in aeroplanes, far in advance of the fleet, should be able to give information enabling him to dispose his forces to the best strategic and tactical advantage. Victory may well depend upon this."

"As in the case of the submarine, it is only the power which commands the sea that can secure the full use and freedom of action of aircraft borne in aircraft carriers and in other vessels of the fleet. It is therefore imperative that the air arm of the Navy should be developed, unhampered, side by side with the gunnery arm, the torpedo arm, and the other arms which go to make up the efficiency of the fleet; and that a proper proportion of the personnel of the Navy should be devoted to its development as is the case with the other arms."

### Air Ministry Appointment

SIR SAMUEL HOARE, Secretary of State for Air, has appointed Sir Sigmund Dannreuther, C.B., at present Joint Secretary of the Disposal and Liquidation Commission, to be Deputy Secretary of the Air Ministry, in succession to Mr. W. A. Bland, C.B., who is about to retire. Mr. Bland has been the principal Finance Officer of the Air Ministry since its formation, having previously served for more than 33 years under the War Office.

### Air Matters at the Imperial Conference

In the official summary of the proceedings of the Imperial Conference, under the sections dealing with defence questions, the Conference records certain conclusions on the chief matters that have been discussed, of which we reproduce two referring to air matters. The first, sub-paragraph (e) of

paragraph (3), states that the Conference suggests as a guiding principle "The desirability of the development of the Air Forces in the several countries of the Empire upon such lines as will make it possible, by means of the adoption, as far as practicable, of a common system of organization and training and the use of uniform manuals, patterns of arms, equipment, and stores (with the exception of the type of aircraft), for each part of the Empire as it may determine to co-operate with other parts with the least possible delay and the greatest efficiency." In sub-paragraph (c) of paragraph (4) of the Defence Resolutions the Conference takes note of "The necessity for the maintenance by Great Britain of a Home Defence Air Force of sufficient strength to give adequate protection against air attack by the strongest air force within striking distance of her shores."

# LIGHT 'PLANE AND GLIDER NOTES

THE demonstration at Croydon on Saturday last provided an excellent opportunity of showing to Dominion representatives some of the light aeroplanes that took part in the recent competitions at Lympne. It seems fairly evident that when a little further developed the light 'plane should be capable of doing excellent work in the Colonies, where distances are larger than at home, and where roads and railways have not attained the stage of development which they have reached in this country. It was therefore very appropriate that the light 'plane should be represented at Croydon, and all the visitors evinced the greatest interest in the five monoplanes and one biplane which took the air there on Saturday.

READERS of FLIGHT are already familiar with all the six light 'planes that took part in the "fly-past," but a few remarks concerning certain alterations which have been made to some of the machines may be of interest. The Avro monoplane was flown by Bert Hinkler, and was remarkably well handled. She had had the smaller set of wings fitted, and this seems to have resulted in an all-round improvement. She is faster, seems to climb just as well, and is, if anything, more manoeuvrable. In coming in to land Hinkler made some very pretty sharp S-turns, showing how a pilot has ample time, when making a forced landing, for carrying out any evolution that may be necessary in order to get into a small field. Hinkler flew the monoplane up from Hamble on Friday November 9, the journey being accomplished, in spite of a slight detour over Bookham, Surrey, where the Blackburne works are situated, in 1 hour 15 mins. The return journey was made on Sunday, when the fog kept many other machines on the ground. Flying over Epsom, Hinkler could only faintly distinguish the race course buildings, and immediately afterwards he ran into very thick fog, which covered the ground entirely. It was not until he reached the South Coast that he again got a glimpse of the ground, and then the weather cleared and the last bit of the trip was made in good visibility. The return journey was made in 1 hour 10 mins. The total petrol consumption for the double journey and for the flight at Croydon worked out at only a little over 2 gallons of petrol.

THE Vickers "Viget" seemed to fly much better on Saturday than she did recently at Hendon, and Capt. Cockerell handled her very well. On coming in to land he, like Hinkler, made a series of S-turns, and although apparently equally controllable the machine seemed less inclined to "flick" than she was at Hendon. The explanation was later learned to be that the wings, which originally had a very pronounced dihedral, have been somewhat flattened out, so that side gusts do not now tend to roll the machine as much as they did previously. The change seems to be altogether beneficial.

THE English Electric Company's "Wren" flew very strongly indeed, and Flight-Lieut. Longton managed to give short exhibitions of slow-flying, stalling, and "crazy flying."

THE A.N.E.C. monoplane was flown by "Jimmy" James in his usual style, but the very limited time available did not allow of anything more than a short circuit of the aerodrome. As usual the machine flew well, and did not seem at all worried by the high wind.

THE D.H.53 (which was "Sylvia II" and not the No. 8 usually flown by him), piloted by Capt. Broad, flew splendidly as usual, and the Blackburne engine, mounted in the inverted position, as in the A.N.E.C., seemed to run very smoothly. Broad did not have an opportunity of giving an exhibition of looping and rolling, manoeuvres which readers of FLIGHT know the machine to have performed repeatedly.

THE Parnall "Pixie" was prevented by a sulky engine from really showing her paces, Capt. Macmillan only just being able to get round the aerodrome and to land from a very low height. It seems that he made most of his circuit on one cylinder only. Incidentally this is a rather remarkable performance, considering that the wing loading is very high, and the power loading, with but one cylinder working, must be extremely high also. Nevertheless "Mac" managed to get around without incident, although at times the performance looked somewhat alarming.

ELSEWHERE in this issue of FLIGHT will be found an abstract of a very interesting paper read by Dr. Hankin before the Institution of Aeronautical Engineers last week. Considerations of space do not allow of publishing the discussion that followed the reading of the paper, but those interested should obtain a copy of the Society's *Minutes of Proceedings*, in which the paper and discussion will be published. Capt. Sayers expressed the view that there was nothing in the paper which did not tally with our accepted ideas on the subject.

THE first Dutch light 'plane was tested in flight recently, when it made a "flip" of 16 minutes' duration, covering in that time the distance between the Waalhaven aerodrome, at Rotterdam, and Scheveningen. The machine is designed by Mr. Carley, technical director of a limited company with offices at Fluweelen Burgwal 1, 's-Gravenhage, Holland. The commercial director of the firm is Mijnheer H. v. d. Kwast, and the works are situated at Voorburg, den Haag. The title of the firm is Carley's Aeroplanes.

THE Carley light 'plane is a cantilever monoplane fitted with a three-cylinder 20-22 h.p. Anzani engine. The fuselage is of triangular section, with one corner forming the "keel." The wheel axle is hinged to this keel, and braced by rubber cords carried on two V's from the top longerons. In general arrangement the machine is not unlike the R.A.E. Aero Club's "Hurricane." A gravity petrol tank is mounted on top of the fuselage, just aft of the top cylinder, and partly serves to streamline the latter. The pilot is placed between the wing spars, and is seated fairly high so as to give a better view. In this respect the machine somewhat resembles Raynham's Handasyde light monoplane.

It is not yet possible to give illustrations of the Carley light monoplane, but the following particulars may be of interest: The overall length is 5 m. (16 ft. 5 ins.); the span is 7 m. (23 ft.) and the total wing area 10.5 sq. m. (113 sq. ft.); the weight empty, with the three-cylinder Anzani, which weighs 57 kgs. (125 lbs.), is given as 135 kgs. (300 lbs.), and the petrol capacity is 18 litres, stated to be sufficient for a flight of 3½ hours' duration. The landing speed is in the neighbourhood of 30 m.p.h., and the maximum speed 130 km. (80 m.p.h.).

## THE SOARING FLIGHT QUESTION\*

ONE reason for the neglect of the question of soaring flight by contemporary scientists is psychological. Discoveries that show that existing beliefs are wrong, or that long cherished beliefs need revising, are usually accorded a very hostile reception. The facts of the case of soaring flight are of this nature.

There is another reason by which my own contribution to the subject is handicapped. My very slight acquaintance with physics, with meteorology and other sciences that may be concerned has made it difficult for me to know which facts were most worth observing or most deserving of publication. My r.l.e has been merely that of an animated photographic camera recording facts of whose meaning and importance I was and am ignorant.

Hitherto the subject has been treated by me as if maintain-

ance in the air of the soaring animal was the only thing to be explained. It is possible, however, that some of the phenomena that accompany soaring flight may turn out to be scientifically more important. The following examples are worth our attention.

The humming sound made by flying-fishes when in gliding flight has been noted by others. The musical whirring sound made by vultures is well known. A few instances have come under my observation in which gliding of vultures and cheeks was silent in unsoarable air, but was accompanied by whirring when, a few minutes later, the air had become soarable. When diving in soarable air vultures make a loud crackling, roaring sound similar to that made by a large rocket. It is so loud that, even in the presence of wind, it may be heard from a distance of at least 300 metres.

Another peculiar phenomenon seen in soaring flight may be described as "distortion." The Bengal vulture has part of

\* Abstract of Paper read by Dr. E. H. Hankin, M.A., before the Institution of Aeronautical Engineers on November 9.



the underside of its wings of a white colour. When circling the white area appears a little larger than it does in the dead bird. When soaring at a higher speed than circling, the white area appears magnified to more than twice its real size. When thus gliding across the field of view and seen from the side, the white area of the near wing appears magnified and that of the far wing appears diminished.

The third peculiar phenomenon to be described is the appearance of colour on the underside of the wings of soaring birds. If one watches a scavenger vulture in soaring flight the white portion of the underside of its wing appears of a bright chrome yellow colour. If the bird is looked at through a crystal of Iceland spar two images of the bird are seen. One of these images appears yellow, while, on some occasions, the other image appears snow white. If the bird is on a curved course the inside wing has the deeper colour. This description applies to the Bengal vulture and to the scavenger vulture. In the adjutant bird the colour appears not on the wings, but on the underside of the body. If an adjutant is on a curved course a patch of deeper yellow appears on the side of the body near to the inside wing. If any of these birds ceases to take energy from the air, if, that is, by flexing its wings it begins to fall feet foremost through the air, the yellow colour instantly vanishes. If the bird then changes its mind and decides to glide on instead of landing, the yellow colour reappears as it extends its wings and begins to regain its speed ahead.

The next phenomenon to consider is the occurrence of steep upward glides without apparent loss of speed. These have been observed by me in different species of birds, and also in the case of dragon-flies. In such glides the long axis of the body is tilted up in the direction in which the soaring animal is travelling. The plane of the wings, so far as observation shows, also lies in the line of flight. This is entirely the reverse of what occurs when the bird is in a known ascending current. In such a current the bird is lifted gradually as on a rising tide. Its long axis is horizontal, and the plane of the wings, whenever observable, shows an apparent negative angle of incidence which, as already explained, indicates the positive angle of incidence with the bird's relative wind. The change to this apparent negative angle at the moment of entering the ascending current on the windward side of the steamer has been observed by me in the case of gulls. In the steep upward glides we are now considering there is no apparent negative angle. There is no gradual lifting as on a rising tide. The bird shoots upwards almost as if fired out of a gun. Gulls show an apparent increase of speed at the moment of commencing the upward glide. That this is a real increase of air speed is made probable by the fact that it is accompanied by an increase of flexing of the wings, which is the disposition used in high-speed flight. An instance has been observed by me of two scavengers making a steep upward glide for a distance of more than 200 metres, their course while doing so making an angle of between  $30^\circ$  and  $40^\circ$  with the horizon. In the case of gulls the steepness of the glide may be much more. It may amount to as much as  $70^\circ$  or  $80^\circ$  with the horizon.

If maintenance in the air was the only thing accomplished by the soaring bird, it might be justifiable to settle the matter by assumptions about its gliding angle and suppositions about ascending currents. The occurrence of these steep upward glides furnishes a clear proof that something more is required.

The most astounding fact about these upward glides is that they only occur on occasions when there are grounds for suspecting that the bird is in a descending current.

On the windward side of a steamer there is an ascending current in which gulls sometimes glide with gradual gain of height as usual in such currents. At or near the stern of the steamer, and especially on its leeward side, there is usually a descending current. Often, but only if wind is present, gulls can soar when enveloped in this descending current. It is in this descending current that steep upward glides occur. Gulls that have stayed behind for food may be seen overtaking the ship by flapping flight just above water level. When they reach the leeward side of the stern, still near water level, they may be seen to make a sudden turn upwards, to cease flapping, and to glide steeply upwards, usually to about the level of the stern flagstaff. When near the level of the top of the flagstaff they may be near the limit of the descending current. There may be room for arguing that they are outside of it and aided by a neighbouring ascending current. Hence this glide upwards is of interest in that it begins near water level, where it is very difficult to believe that any strong upward current can be present.

In these steep upward glides in a descending current we see the mysterious force of soarability in its strongest form, and

here is where one should look for some clue to the nature of the phenomenon.

The first question that arises is whether these apparently descending currents are really descending. A very interesting observation by Mr. J. D. North bears on this point. He informs me that at the stern of a steamer he has observed pieces of paper that he had thrown overboard rising continuously when enveloped in dilute descending smoke. That is to say, there was an admixture of ascending air that carried the paper with descending air that carried the smoke particles. Major Turner, in a very suggestive paper on soaring flight, quotes experiments by Dr. Betz of Gottingen, in which it was found that if an alternating up-and-down movement was given to the air current in a wind channel, a model wing showed negative resistance; that is, it tried to move against the wind stream. These facts suggest the theory that in descending currents in which soaring flight has been observed neighbouring masses of air may be ascending and descending relatively to each other and that, as in the experiment of Dr. Betz, such opposed movements can do more for the soaring bird than could the ascending component alone. Should soaring flight in descending currents be due to such a cause one might anticipate that a descending mass of air striking another mass of air relatively at rest would be better fitted for such flight than a "contour current" formed by a light wind flowing over a rounded surface, for in the former case there would be much more tendency for a mixture of air currents flowing in different directions to be formed than in the latter. Further, if alternations of air direction have to do with soaring flight one might anticipate that a certain minimum speed would be necessary before soaring, as distinct from gliding, could begin. Further, one might anticipate that a particular speed of the bird would be appropriate to a particular degree of alternation. Also, if a bird on entering the descending current lacked the necessary speed, one might anticipate that, or at least would not be surprised, if, at that moment, it showed some form of instability. Let us see how far the facts of the case agree with such anticipations.

In dust-storms of the kind that have been described by me as "primary dust-storms," the dust is raised by steeply descending currents that strike the earth as if coming from a gigantic hosepipe. In such descending currents cheels and scavengers make steep upward glides, recalling those made by gulls at the stern of a steamer. Such glides appear always to commence at the moment when the bird is struck by a gust, as shown by movements of the trees below them. A proof that it is at this moment that the bird is entering the descending current is given by the fact that at this moment the bird shows instability round the transverse axis. It has been found by me that both soaring and non-soaring birds show this form of instability when leaving but not when entering an ascending current. One would expect them therefore to show it also when leaving relatively still air for a descending current. This instability is shown or countered by the bird by a sudden upward jolt of the tail and depression of the wings. At the moment of entering a descending current of a dust-storm the bird shows tail-jolting which may be at the rate of four or five jolts per second. With gulls, on entering the descending current at the stern of a steamer, this form of instability has been seen by me, but it is very transient and difficult to observe. It may be replaced by a trembling of the wings. In the case of two scavengers gliding upwards in a dust-storm gust, already mentioned, my notes relate that they were tail-jolting all through their upward glide for at least 200 metres, and that it was so marked as to be visible with the naked eye though the tail of the scavenger is much smaller than that of the cheel. This may be regarded as a proof that all through the glide, which was at high speed, they were passing through portions of air that relatively to each other were ascending and descending. The immediate neighbourhood of dust-storm gusts contains rising currents, as shown by the movements of the dust, but in such air other forms of instability occur and no steep upward glides.

On one occasion a dust-storm was observed by me which reached the steamer while we were going through the Red Sea. When struck by gusts of this storm, gulls in the soarable area glided ahead with very great and sudden increase of speed. On one occasion, near the Straits of Bonifacio, in a gale of wind, which came from nearly ahead, some gulls were following the ship in gliding flight. Occasionally one of them turned round and glided for a long distance, at least 100 metres away from the ship to leeward. It did this with its wings fully extended and flat as if to check speed. Then it turned round to glide again towards the ship. It did this with wings flexed and arched—that is, in the high-speed wing disposition. During this glide up to the ship its speed through the air must have approached 30 metres per second. The fact of a

gull gliding to leeward slowly, then turning and gliding upwind at such enormous speed, yields a further proof that in soaring flight we have to do with a far greater expenditure of energy than is involved in mere maintenance of height in the air. The main mass of the air, in which these 100-metre glides from leeward were made, probably had a slight descending trend. That it was highly turbulent was proved by the instability shown by the gulls.

The air brought down in the descending currents of a dust-storm travels for long distances as a dust-laden but not dust-raising wind. This has been described by me elsewhere as the "derived dust-storm." Owing to friction with the surface of the ground, the advancing margin of this air current has a rolling movement causing a restricted descending current. An instance has been observed by me in which wheels rose into the air in gliding flight on the coming of the dust-laden air. But as soon as they were out of the probable area of the descending current, which happened within two or three seconds, they glided with loss of height and settled. This occurred near my post of observation. The dust-laden air passed on and, three miles away, reached a row of factory chimneys. The smoke of each chimney in turn was momentarily depressed to ground level as the dust reached it, thus proving the presence of the temporary descending current at the advancing margin of the dusty air.

Under some atmospheric conditions isolated gusts of wind descend, striking the earth at an angle and raising masses of dust that have been described by me as "dust-curtains." Wheels have been seen by me soaring in steady flight in a wind in which no dust-curtains were being formed. When the wind changed in character so that dust-curtains began to appear, immediately the wheels, at intervals, began to show transverse axis instability and either increase of speed ahead or upward glides. Conversely, a soarable wind in which dust-curtains were present has been seen by me to change into an unsoarable wind as soon as dust-curtains ceased to be formed.

On one occasion a dragon-fly was seen in a dust-curtain. While within the dust it glided horizontally, but after passing through the dust, when probably enveloped in the descending air, it glided upwards for about 3 metres, its course making an angle of about 40° with the horizon. Such long upward glides are never made by soaring dragon-flies under ordinary conditions.

In thundery weather a gust of wind usually precedes a rain shower. Since this gust commonly has a slight power of raising dust it probably has a descending trend. In this wind wheels always rise in gliding flight. They do so even if the wind comes after sunset and in deep twilight, that is, at a time when, in the absence of this wind, the air would be completely unsoarable. In 1917 a gust of wind of this nature was observed by me that covered an area measuring about one mile by three miles. Within it birds were soaring with steep gains of height and showing strongly marked transverse axis instability. Soaring flight having these peculiarities had not been seen by me during the preceding three years owing to the chance that no primary dust-storms had occurred during that time in Agra.

Thus we see that steep upward glides, often at high speed, occur in descending air in cases in which there is likely to be a violent mixing of differently moving masses of air. Now let us consider instances of soaring flight in descending contour currents in a light wind.

Soaring flight in the Himalayas generally takes place in ascending currents of air. But on one occasion, at Naini Tal, a wheel was seen circling and gaining height when enveloped in thin cloud and in a current that descended at an angle of about 15° with the horizon. The gain of height while in this

descending current was about 150 ft. The gliding was at low speed, with only a very gradual gain of height. It was recorded in my notes that "at the time the wheel was gaining height, it was in cloud sufficiently thin to let through enough sun energy to make heat eddies (my term for convection currents), judging from the amount of glare at the time, and from the results of observation of heat eddies that I had made two hours previously." Thus it is probable that the descending air was diluted with ascending convection currents.

The only other instance known to me of soaring flight by a bird in a contour current in India happened at Matheran, a hill station in the Bombay Presidency. This is situated on a flat-topped ridge rising probably about 2,000 ft. above the surrounding plain. During a visit there wheels and other birds were seen by me on the windward side of the hill being lifted by the rising current. Wishing to see true soaring flight, I went to the leeward side of the hill, and there found a place where vultures had made their nests in a position where for the greater part of the year they were probably exposed to a descending current of air. Near by they were circling with unusually steep gains of height. This occurred in sunshine when rising convection currents probably were being formed. It may be repeated that in the known ascending current on the windward side of the hill, where convection currents, if present, were flowing in the same direction as the ascending wind, no such steep upward glides were observed.

Thus far the facts seem to agree fairly well with the idea that soaring flight in descending currents is due to mixing of ascending and descending masses of air or at least to some kind of turbulent motion. Now let us consider some of many facts known to me that indicate that, even if the suggestion contains some germ of truth, much more research is necessary before we can hope to understand the phenomenon.

In the first place the presence of wind seems necessary to permit the development of a soarable area at the stern of a steamer. In the absence of wind, there is still a relative wind caused by the movement ahead of the steamer, and presumably a descending current at the stern. But under such conditions no soarable area is formed. Gulls following the steamer do so by flapping flight. On one occasion, after this had been observed, a light wind appeared coming from the port quarter. Its speed was much less than that of the ship, so that smoke was left behind over the starboard quarter. Apart from any turbulence that this wind brought with it, it must have resulted in a decrease in turbulence of and decrease in the strength of the descending current at the stern. Nevertheless, a soarable area appeared.

Further, some winds, though fitted by their force and direction to aid mixing of ascending and descending air masses in the descending current at the stern, as in Mr. North's observation, do not permit the appearance of a soarable area. On leaving Port Said in February last year the behaviour of the gulls suggested that the wind was losing its power of forming a soarable area in the descending current, in that the gulls when gaining height moved as if they were being lifted one wing at a time. Also their gliding upwards was interrupted. Commonly each gain of height was only about a foot. On the following day the wind was on the quarter, and there was no soarable area. Gulls accompanying the ship were in circling flight at a height of about 400 metres. Below this level they flapped.

Perhaps something might be learned about soaring flight by means of model gliders. The lecturer proposes to discuss this question. Having now made 45 small gliders, he hopes soon to be able to make them sufficiently well for scientific experiments, and is anxious to find someone expert in aeronautics to fly them for him.

## LONDON TERMINAL AERODROME

Monday evening, November 12, 1923

NOVEMBER fog has made its appearance, and has interfered to some extent with the regular running of the various services, and fog in Germany held up the return Daimler from Berlin to London at Hanover one day during the week, but, generally speaking, the new direct London-Berlin service which the Daimler people are running is doing as well as could be expected at this time of the year. This service is now being run regularly, leaving London at 8.10 a.m. every Monday, Wednesday, and Friday, and Berlin at the same time every Tuesday, Thursday, and Saturday. The short route is now taken, being by way of Rotterdam and Hanover, and the actual time of the journey is reduced to 8 hours. The stops are made as short as possible, leaving just sufficient time to take on the requisite quantity of petrol, and in order that this shall not inconvenience the passengers, luncheon boxes are

provided free for all passengers travelling through to Germany. These boxes, which are supplied by Trust Houses, Ltd., include a small bottle of port for women passengers and a small bottle of whisky for the men.

The Daimler Airway also intend to run their London-Manchester service on Sundays in future, the times being the same as the week-day service.

The aerodrome has been extremely animated for the past week owing to the aerial pageant staged for the benefit of the Dominion Prime Ministers on Saturday, which is dealt with elsewhere in this issue.

So great has the goods traffic to Cologne now become that the Instone Air Line have been compelled to open another office to deal exclusively with this goods traffic, and have taken over the first building on the north side of the aerodrome Broadway as it is approached from Plough Lane.



# THE ROYAL AIR FORCE

London Gazette, November 2, 1923

## General Duties Branch

Pilot Officer on probation V. J. Hatton is confirmed in rank; Oct. 15. Flight-Lieut. A. L. Lingard is transferred to the Reserve, Class B; Oct. 24.

London Gazette, November 6, 1923

## General Duties Branch

Flight Lieut. A. R. Thomas is placed on half-pay, Scale B; Nov. 6. Air Commodore C. A. H. Longcroft, C.B., C.M.G., D.S.O., A.F.C., is restored to full pay from half-pay; Oct. 29. Flying Officer C. B. Mitcalfe Dale is transferred to Reserve, Class B; Dec. 5, 1922 (substituted for Gazette, Dec. 5, 1922).

## Reserve of Air Force Officers

The following Flying Officers are confirmed in rank:—J. Edelsten, E. B. Wilson; Sept. 10. C. F. Uwins; Oct. 7. J. R. Austin, P. F. F. Belton, L. G. Brazier, H. E. Browne, C. J. Chabot, P. G. Clarabut, J. H. Colbert, H. M. Gibbs, R. C. D'Arcy Gifford, G. T. Griffith, J. O. Groves, E. W. Jordan, W. F. Knight, H. E. W. Macandrew, F. G. S. Musson, M. A. Newnham, D.F.C.; Oct. 20.

## Erratum

Gazette of Oct. 26, page 7215.—For C. M. Read read C. M. Reid.

London Gazette, November 9, 1923

## General Duties Branch

The following are granted permanent comms. in the ranks stated (Nov. 7): Flight Lieut. R. G. Gardner, D.S.O. Flying Offr. C. E. Barraclough. Flight Lieut. A. F. Quinlan (Lieut., Army, retd.) is granted a short service comm. in rank stated; Aug. 1. A. F. Lingard is granted short service comm. as Flying Offr., with effect from, and with seny. of, Oct. 25. H. E. E.

Webbin (Lieut., R.N., retd.) is granted short service comm. as Flying Offr. for seven years on active list; Oct. 4.

The following Pilot Offrs. are promoted to rank of Flying Offr.:—W. C. Yale; Dec. 21, 1922. E. A. Hodgson; Feb. 16. G. H. Mills, R. N. Waite, W. J. M. Akerman, A. P. Revington, M. B. Mackay, R. A. R. Mangles, F. C. T. Rowe, D. W. F. Bonham Carter, C. L. Falconer, G. Combe, T. J. Desmond, G. W. Gay, R. W. Pontifex, M. H. Garnons-Williams; June 20.

The following Pilot Offrs. are confirmed in rank:—B. J. Finn, F. B. Robinson; Oct. 3.

## Stores Branch

The following Pilot Offrs. are confirmed in rank and promoted to rank of Flying Offr.:—F. C. C. B. Hichens, N. W. Law, J. H. P. Clarke, F. A. K. Smith; July 2. G. Bucknall, R. A. Dolton; Aug. 21. Flight Lieut. P. J. Murphy relinquishes acting rank of Sqdn. Ldr.; Sept. 23.

## Medical Branch

Flight Lieut. B. F. Beatson, D.T.M. (Capt., I.M.S.), is granted a permanent comm.; Nov. 7. The following Flying Offrs. are promoted to rank of Flight Lieut.:—T. J. D. Atteridge; Nov. 16. E. C. K. H. Foreman; Nov. 7. W. J. G. Walker; Nov. 7.

## Chaplains' Branch

The Rev. J. A. Jagoe, M.A., is granted short service comm. as Chaplin with relative rank of Sqdn. Leader; Oct. 30. The Rev. B. W. Keymer, O.B.E., M.A., is appointed as Hon. Chaplin to the R.A.F. on resignation; Oct. 29.

## Reserve of Air Force Officers

The following are granted comms. in the General Duties Branch as Pilot Offrs. on probation, with effect from dates indicated:—Class A.—W. A. Rollason; Nov. 5. Class A.A.—H. H. Perry; Nov. 6.

## ROYAL AIR FORCE INTELLIGENCE

**Changes in Higher Commands.**—The following changes in the higher commands of the Royal Air Force are notified:—

1. Air Vice-Marshal Sir Edward L. Ellington, K.C.B., C.M.G., C.B.E., Air Officer Commanding, Royal Air Force, Middle East, to be Air Officer Commanding in India, vice Air Vice-Marshal Philip W. Game, C.B., D.S.O. To date 5.11.23.

2. Air Vice-Marshal Philip W. Game, C.B., D.S.O., Air Officer Commanding in India, to be Air Member for Personnel on the Air Council, vice Air Vice-Marshal O. Swann, C.B., C.B.E. To date about November 26, 1923.

3. Air Vice-Marshal O. Swann, C.B., C.B.E., Air Member for Personnel, to be Air Officer Commanding, Royal Air Force, Middle East, vice Air Vice-Marshal Sir Edward L. Ellington, K.C.B., C.M.G., C.B.E. To date about January 15, 1924.

**Appointments.**—The following appointments in the R.A.F. are notified:—

## General Duties Branch

**Squadron Leaders:** D. C. S. Evill, D.S.C., A.F.C., to No. 70 Squadron, Iraq. 12.10.23, to command. G. F. Breese, D.S.C., to Basrah Group H.Q., Iraq. 30.10.23.

**Flight Lieutenants:** E. D. Atkinson, D.F.C., A.F.C., to No. 84 Sqdn., Iraq. 14.9.23. A. J. Long to No. 4 Armoured Car Co., Iraq. 14.9.23. G. M. F. O'Brien, D.S.C., to No. 5 Armoured Car Co., Iraq. 14.9.23. J. J. Williamson, A.F.C., to Basrah Group H.Q., Iraq. 14.9.23. G. H. Martingell, A.F.C., to H.Q., Iraq. 14.9.23. G. T. Richardson to No. 6 Armoured Car Co., Iraq. 14.9.23. J. H. Simpson to Basrah Group Headquarters, Iraq. 24.8.23. G. W. Mackey to No. 208 Sqdn., Egypt. 1.10.23. J. A. Slater, M.C., D.F.C., to No. 70 Sqdn., Iraq. 25.9.23. H. M. K. Brown to No. 5 Armoured Car Co., Iraq. 12.10.23. J. G. Walsler, M.C., to No. 31 Sqdn., India. 2.10.23, instead of to No. 60 Sqdn., as previously notified. A. F. Brooke to Air Ministry. 15.11.23. D. L. Ingpen to H.Q., Iraq. 2.11.23. O. R. Gayford,

D.F.C., to Schl. of Naval Co-operation, Lee-on-Solent. 24.11.23, for course of instruction.

**Flying Officers:** J. M. Fairweather, D.F.C., to No. 1 Sqdn., Iraq. 14.9.23. S. D. Macdonald, D.F.C., to No. 3 Armoured Car Co., Iraq. 14.9.23. G. S. Hodson, A.F.C., to No. 55 Sqdn., Iraq. 14.9.23. J. R. F. Randell, D.F.C., to Basrah Group H.Q., Iraq. 14.9.23. L. W. Park to No. 4 Armoured Car Co., Iraq. 14.9.23. A. E. Thompson, C. Crawford, C. A. C. Fiddler, D.C.M., and G. E. Litton, all to Aircraft Depot, Iraq. 25.9.23. C. H. V. Hayman to Stores Depot, Iraq. 25.9.23. C. W. Usher to H.Q., Iraq. 27.9.23. T. H. Moon to No. 84 Sqdn., Iraq. 25.9.23. J. W. Mitchell to No. 216 Sqdn., Egypt. 1.10.23. L. W. Beck to No. 70 Sqdn., Iraq. 25.9.23. F. Porter and L. J. Booth, both to School of Naval Co-operation, Lee-on-Solent. 24.11.23, for course of instruction. R. B. Harnden to R.A.F. Base, Gosport. 7.11.23. R. de L. Stedman to Boys' Wing, Cranwell. 7.11.23. S. T. B. Cripps, D.F.C., to No. 19 Sqdn., Duxford. 19.11.23. C. W. McK. Thompson, to R.A.F. Depot. 6.11.23, on appointment to a Short Service Comm. L. T. Kerry to No. 2 Armoured Car Co., Palestine. 5.10.23. A. L. Harris to No. 20 Sqdn., India. 15.10.23, instead of to No. 31 Sqdn., as previously notified.

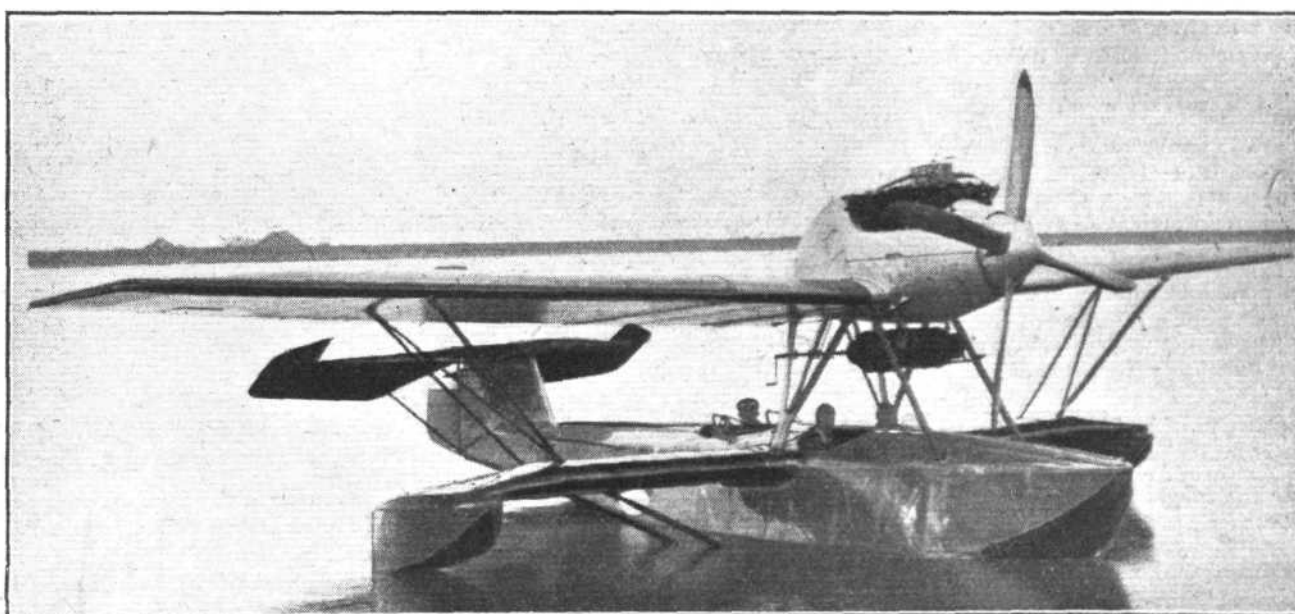
**Pilot Officers:** B. N. Murgatroyd to No. 55 Sqdn., Iraq. 14.9.23. W. C. P. Bullock, N. C. Ogilvie-Forbes, R. E. Bain, K. R. Brown, and C. W. A. Byrne, all to No. 2 Flying Training Sch., Duxford. 7.11.23. R. G. Rickman to R.A.F. Depot. 9.10.23, on transfer to Home Estab.

## Medical Branch

**Squadron Leader** W. A. S. Duck, O.B.E., to Palestine Gen. Hospital. 27.9.23.

**Flight Lieutenants:** H. A. Tillman, M.D., to No. 7 Sqdn., Bircham Newton. 7.11.23. J. J. Walsh, to R.A.F. Depot. 1.11.23.

**Flying Officer** T. V. O'Brien, M.B., to No. 2 Flying Training Sch., Duxford. 5.11.23.



**A NEW FOKKER FLYING BOAT:** This is the Fokker B.II, with 360 h.p. Rolls-Royce "Eagle" engine, the Duralumin hull of which was exhibited at Gothenburg. A series of these machines has been ordered by the Dutch Colonial Office for use in the Dutch East Indies. The machine has a length of 9.85 m. (32 ft. 4 ins.) and a span of 14.8 m. (48 ft. 6 ins.). The area is 40 sq. m. (430 sq. ft.), and the useful load is 800 kgs. (1,760 lbs.), including fuel for 4 hours.



**By DOUGLAS B. ARMSTRONG**  
**First British Glider Post**

NONE of the published accounts of the Light Plane Trials at Lympe, October 8 to 13, seems to have referred to the special mail flight which took place on the last day of the meeting. About 100 letters, enclosed in special souvenir envelopes, were carried by Mr. "Jimmy" James in the A.N.E.C. machine that put off from Lympe at 3 o'clock on the Saturday afternoon, the mail-bag being dropped by parachute at Hastingleigh, the farthest point on the course, a few minutes later. The letters were conveyed by special courier to the Hastingleigh sub-post office, and thence despatched to their destinations. In the right-hand corner of the envelopes is an oblong grey label bearing a 1½d. postage stamp, and the Hastingleigh postmark, in conjunction with the declaration "Carried by MOTOR GLIDER from LYMPNE to HASTINGLEIGH." Twenty of the letters bore in addition the personal autograph of the pilot, and one of these was exhibited with the winning machine at Selfridges last week.

Aero-philatelists will be keen to add this interesting souvenir to their collections of British air post covers.

**More French Semi-Officials**

ANOTHER set of six semi-official air post stamps was issued at Rouen on September 23 in connection with the Aviation Meeting in that city. It is composed of the values 25, 50, 75 centimes, 1, 2, and 5 francs, somewhat crudely lithographed with a vignette of a plane descending. A similar issue of stamps were created at Amiens on the occasion of the aviation meeting held there on October 7. We are indebted to Colonel W. H. Moffat for sight of flown cover bearing five of these stamps. The main feature of the design is a vignette of three aeroplanes manoeuvring in the ether enclosed within a laurel wreath. Beneath it, in the centre, is a white shield containing the figure of value, whilst the inscriptions read: "Service Postal Aerien" at the top; "Amiens, 7 Oct., 1923," on either side at the foot.

Designed by Henri Rudaux, these stamps are lithographed in large upright-format in the following varieties: 25 centimes, yellow-green; 50 c., blue; 75 c., carmine; 1 franc, blue-green and carmine; 2.50 fr., orange and dark blue. The special postmark is lettered: "AMIENS AVIATION—7.10.23," and the flown covers bore a pink label with the words "PAR AVION" printed in black.

**German Aero-Philatelic Club**

By courtesy of Mr. W. E. Hughes we learn that: "At a numerously attended meeting in Berlin on September 12 last it was unanimously decided to form an aero-philatelic society under the title of the 'Aero Philatelik Club von Deutschland' (A.P.C.D.), for the study of air posts. The following officers were elected: President, Carl Count de Matzenau, Berlin-Grünwald; Vice-President, Bankdirector Hans Ueberall, Chemnitz; Secretary, Dr. Arno Marquardt, Berlin; Treasurer, Herr C. Butow."

**Novelties**

FROM Mr. Francis J. Field we have received an interesting flown cover, used in the Copenhagen-London service and franked with a number of contemporary Danish postage stamps, cancelled with a special air post-mark lettered "KOBENHAVN—LUFT POST," and dated 2.10.23.

The same correspondent submits an envelope bearing a set of current Swiss air stamps obliterated with a souvenir cancellation reading "FLUGTAG—CHUR 30 Sept. 1923." These letters, we understand, were conveyed by air from Chur to Dubendorf on the one day only.

**ANSWERS TO CORRESPONDENTS**

E. V. T. (Matlock).—There is very little value attached to the London Windsor souvenir cards. They usually change hands for a few shillings each.

**SOCIETY OF MODEL AERONAUTICAL ENGINEERS**

A LARGE number of members attended headquarters with friends to hear Mr. B. K. Johnson's lecture. It was very much appreciated by all. The lantern slides gave an excellent idea of the work done by the members during the past twelve months. A hearty vote of thanks was given to Mr. Johnson. Mr. E. Shanly kindly assisted with the lantern.

On November 22 at 7.30 p.m. a lecture, with demonstrations, will be given at Headquarters by Mr. W. E. Evans on "French Polishing."

An important announcement will be made by the Competition Secretary next week.

A. E. JONES, Hon. Sec.

**BUNKERS HILL AERO-MODELS CLUB**

THE above Junior Club has been formed by a number of model aeroplane enthusiasts who reside at Golders Green. They have made their outdoor headquarters Bunkers Hill, which is on the Hampstead Heath extension.

Their Chairman is Mr. F. Folley, of 12, Eastholm, Golders Green, N. 11; Hon. Treasurer, Mr. O. Krohn, of 1, Heath Close, Golders Green, N. 11; and their Hon. Secretary is Mr. P. Pulham, of 56, Willefield Way, Golders Green, N. 11, who will be pleased to forward full particulars to anyone who is interested.

**PUBLICATIONS RECEIVED**

*Aeronautical Research Committee Reports and Memoranda.*—

No. 838 (M. 13). The Mechanics of the Wöhler Rotating Bar Fatigue Test. By Prof. W. Mason, D.Sc. September 1922. Price 3½d., post free.

No. 844 (Ae. 88). A Direction and Velocity Meter for Use in Wind Tunnel Work, etc. By T. Lavender. January, 1923. Price 3½d., post free.

No. 863 (M. 21). The Effect of a Temperature of 212° F. on Steel Submitted to Alternating Torsion. By Prof. W. Mason, D.Sc. February, 1923. Price 9½d., post free.

No. 865 (Ae. 102). On the Use of a Slotted Trailing Flap on Aerofoils of Various Cambers. By F. R. Bradfield. January, 1923. Price 9½d., post free.

No. 866 (Ae. 103). Calculation of the Rotary Derivatives Due to Yawing for a Monoplane Wing. By H. Glauert. February, 1923. Price 6½d., post free.

No. 839 (M. 14). The Constitution and Age-Hardening of Alloys of Aluminium with Copper, Magnesium and Silicon in the Solid State. By Marie L. V. Gayler. June, 1922. Price 1s. 3d., net.

No. 868 (M.N. 5). Tests on Improved Models of Aircraft Compasses. December, 1922. Price 6d., net.

No. 845 (M. 19). Report on Further Investigations of the Effect of Sunlight on Aeroplane Fabric. June, 1922. Price 6d., net. London: H.M. Stationery Office, Kingsway, W.C. 2.

**AERONAUTICAL PATENT SPECIFICATIONS**

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

**APPLIED FOR IN 1922**  
Published November 22, 1923

- 17,284. A. PUSTERLA. Flying-machines capable of vertical and horizontal flight. (205,847.)
- 19,838. C. PINKERT. Screw propellers. (183,473.)
- 20,141. RAUL, MARQUIS OF PATERAS PESCARA. Aircraft. (183,484.)
- 20,321. H. LEITNER. Mechanism for varying pitch of screw propellers. (205,875.)
- 20,564. SOC. INDUSTRIELLE DES METAUX ET DU BOIS. Sustaining and steering surfaces for aerial vessels. (186,039.)
- 29,902. D. L. ROWE and A. E. ATKINSON. Rotary engines. (206,013.)

**APPLIED FOR IN 1923**  
Published November 22, 1923

- 4,932. SOC. ANON. DES AEROPLANES G. VOISIN. Lubricating-devices for valveless engines. (194,677.)

**FLIGHT**

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